CLAIMS

What is claimed is:

1. In an electronic device, a method of resolving a potential artificial algebraic loop, comprising:

providing an executable process having a plurality of functions;

identifying whether the process includes a potential artificial algebraic loop; and

if the potential artificial algebraic loop exists in the process, implementing an artificial algebraic loop solution that modifies a manner by which the plurality of functions forming the potential artificial algebraic loop execute.

2. The method of claim 1, wherein the artificial algebraic loop solution comprises executing at least one of a model update function, a derivative function, and a zero-crossing function by rerouting to execute a model output function to obtain output from the plurality of functions and subsequently executing a remaining at least one of a model update function, a derivative function, and a zero-crossing function computing variables contained within the plurality of functions.

3. The method of claim 2, wherein the at least one of a model update function, a derivative function, and a zero-crossing function executes the output function of a plurality of direct feedthrough functions.

4. The method of claim 1, wherein the artificial algebraic loop solution comprises executing a model output function twice, such that a first execution provides an updated input variable and a second execution provides at least one of a desired output and an internal variable.

5. The method of claim 1, wherein the artificial algebraic loop solution comprises executing a model output function a plurality of times, such that a preceding execution provides an updated input variable that allows a subsequent execution to provide at least one of a desired output and an internal variable.

6. The method of claim 1, wherein the artificial algebraic loop solution comprises inserting a delay function prior to the potential artificial algebraic loop and executing the executable process.

7. The method of claim 6, wherein the delay function comprises at least one of a time delay and a memory function.

8. The method of claim 1, wherein the artificial algebraic loop solution comprises switching the order of direct feedthrough functions and non-direct feedthrough functions to prevent the occurrence of the potential artificial algebraic loop.

9. The method of claim 1, wherein identifying whether the process includes the potential artificial algebraic loop comprises determining whether there is at least one path of execution starting at an input wherein a non-direct feedthrough element follows a direct feedthrough element prior to calculation of an output.

10. The method of claim 1, wherein providing the executable process having a plurality of functions includes providing at least one sub-system containing the potential artificial algebraic loop.

11. The method of claim 1, wherein the artificial algebraic loop solution comprises separating a direct feedthrough part from a remainder of the original content to prevent the occurrence of the potential artificial algebraic loop.

12. The method of claim 1, further comprising representing the executable process using a block diagram format.

13. The method of claim 1, further comprising representing the executable process using an equation format.

14. The method of claim 1, further comprising identifying an execution order for the plurality of functions within the potential artificial algebraic loop.

15. The method of claim 1, further comprising executing the plurality of functions based at least in part on whether each of the plurality of functions contains an update call, a derivative call, and a zero-crossing call.

16. The method of claim 1, wherein modifying a manner by which the plurality of functions forming the potential artificial algebraic loop execute comprises re-ordering the execution order of the plurality of functions.

17. A medium holding computer executable steps for carrying out a method of resolving a potential algebraic loop, the method comprising:

providing an executable process having a plurality of functions;

identifying whether the process includes the potential artificial algebraic loop; and

if the potential artificial algebraic loop exists in the process, implementing an artificial algebraic loop solution that modifies a manner by which the plurality of functions forming the potential artificial algebraic loop execute.

18. The medium of claim 17, wherein the artificial algebraic loop solution comprises executing at least one of a model update function, a derivative function, and a zero-crossing function by rerouting to execute a model output function to obtain output from the plurality of functions and subsequently executing a remaining at least one of a model update function, a derivative function, and a zero-crossing function computing variables contained within the plurality of functions.

19. The medium of claim 18, wherein the at least one of a model update function, a derivative function, and a zero-crossing function executes the output function of a plurality of direct feedthrough functions.

20. The medium of claim 17, wherein the artificial algebraic loop solution comprises executing model output function twice, such that a first execution provides an updated input variable and a second execution provides at least one of a desired output and an internal variable.

21. The method of claim 17, wherein the artificial algebraic loop solution comprises executing a model output function a plurality of times, such that a preceding execution provides an updated input variable that allows a subsequent execution to provide at least one of a desired output and an internal variable.

22. The medium of claim 17, wherein the artificial algebraic loop solution comprises inserting a delay function prior to the potential artificial algebraic loop and executing the executable process.

23. The method of claim 22, wherein the delay function comprises at least one of a time delay and a memory function.

24. The medium of claim 17, wherein the artificial algebraic loop solution comprises switching the order of direct feedthrough functions and non-direct feedthrough functions to prevent the occurrence of the potential artificial algebraic loop.

25. The medium of claim 17, wherein identifying whether the process includes the potential artificial algebraic loop comprises determining whether there is at least one path of execution starting at an input wherein a non-direct feedthrough element follows a direct feedthrough element prior to calculation of an output.

26. The medium of claim 17, wherein providing the executable process having a plurality of functions includes providing at least one sub-system containing the potential artificial algebraic loop.

27. The medium of claim 17, wherein the artificial algebraic loop solution comprises separating a direct feedthrough part from a remainder of the original content to prevent the occurrence of the potential artificial algebraic loop.

28. The medium of claim 17, further comprising representing the executable process using a block diagram format.

29. The medium of claim 17, further comprising representing the executable process using an equation format.

30. The medium of claim 17, further comprising identifying an execution order for the plurality of functions within the potential artificial algebraic loop.

31. The medium of claim 17, further comprising executing the plurality of functions based at least in part on whether each of the plurality of functions contains an update call, a derivative call, and a zero-crossing call.

32. The medium of claim 17, wherein modifying a manner by which the plurality of functions forming the potential artificial algebraic loop execute comprises re-ordering the execution order of the plurality of functions.

33. A system for identifying and resolving a potential algebraic loop in a process, comprising:

an identification mechanism for identifying whether the process includes the potential artificial algebraic loop; and

an artificial algebraic loop solution for resolving the potential algebraic loop;

wherein the artificial algebraic loop solution modifies a manner by which the plurality of functions forming the potential artificial algebraic loop execute.

34. The system of claim 33, wherein the artificial algebraic loop solution comprises executing at least one of a model update function, a derivative function, and a zero-crossing function by rerouting to execute a model output function to obtain output from the plurality of functions and subsequently executing a remaining at least one of a model update function, a derivative function, and a zero-crossing function computing variables contained within the plurality of functions.

35. The system of claim 34, wherein the at least one of a model update function, a derivative function, and a zero-crossing function executes the output function of a plurality of direct feedthrough functions.

36. The system of claim 33, wherein the artificial algebraic loop solution comprises execution of a model output function twice, such that a first execution provides an updated input variable and a second execution provides at least one of a desired output and an internal variable.

37. The method of claim 33, wherein the artificial algebraic loop solution comprises execution of a model output function a plurality of times, such that a preceding execution provides an updated input variable that allows a subsequent execution to provide at least one of a desired output and an internal variable.

38. The system of claim 33, wherein the artificial algebraic loop solution comprises insertion of a delay function prior to the potential artificial algebraic loop and execution of the executable process.

39. The method of claim 38, wherein the delay function comprises at least one of a time delay and a memory function.

40. The system of claim 33, wherein the artificial algebraic loop solution comprises a switching of the order of direct feedthrough functions and non-direct feedthrough functions to prevent the occurrence of the potential artificial algebraic loop.

41. The system of claim 33, wherein the identification mechanism determines whether there is at least one path of execution starting at an input wherein a non-direct feedthrough element follows a direct feedthrough element prior to calculation of an output.

42. The system of claim 33, wherein the process includes at least one sub-system containing the at least one artificial algebraic loop.

43. The system of claim 33, wherein the artificial algebraic loop solution comprises separation of a direct feedthrough part from a remainder of the original content to prevent the occurrence of the potential artificial algebraic loop.

44. The system of claim 33, further comprising the executable process represented in a block diagram format.

45. The system of claim 33, further comprising the executable process represented in an equation format.

46. The system of claim 33, further comprising the system having an execution order for the plurality of functions within the potential artificial algebraic loop.

47. The system of claim 33, further comprising the system having an execution order for executing the plurality of functions based at least in part on whether each of the plurality of functions contains an update call, a derivative call, and a zero-crossing call.

48. The system of claim 33, wherein modifying a manner by which the plurality of functions forming the potential artificial algebraic loop execute comprises re-ordering the execution order of the plurality of functions.

49. In an electronic device, a method of resolving a potential artificial algebraic loop, comprising:

providing an executable process having a plurality of functions;

identifying whether the process includes at the potential artificial algebraic loop; and

if the potential artificial algebraic loop exists in the process, implementing an artificial algebraic loop solution that modifies a manner by which the plurality of functions forming the potential artificial algebraic loop execute by introducing a time delay operation in the execution order.